



U.S. Army Corps of Engineers Environmental Research & Development

Buried Unexploded Ordnance (UXO) Detection Research and Development

Description of Technology

Research ranges from fundamental studies and phenomenological modeling to development and evaluation of advanced sensor systems and supporting technologies for enhanced UXO detection, discrimination, and identification.

Benefits

Buried UXO detection capabilities are improving. However, the capability to discriminate anomalies caused by UXO from anomalies caused by non-hazardous man-made and natural objects (i.e., false alarms) has not significantly improved. The necessity of digging up false alarm anomalies for UXO removal assurance is the dominant cost driver for UXO remediation. Effective UXO discrimination capability, through new sensing technologies or enhanced data analysis procedures, will significantly decrease the cost and increase the safety of UXO cleanup. Buried UXO identification capability does not presently exist and is the ultimate goal of all research and development efforts.

Significant Accomplishments

Completed ESTCP-funded demonstrations of advanced electromagnetic induction (EMI) technologies operating in high magnetic environments.

Developed numerical and analytic models of magnetic, electromagnetic induction, and ground-penetrating radar signatures of realistic UXO geometries. Continuing enhancement and validation of models, and also developing inverse modeling approaches.

Developed improved multifrequency EMI sensors.

Developed enhanced forward and inverse modeling techniques for multi-channel time-domain EMI sensing.

Executed SERDP-sponsored project to extend the frequency range of current EMI methods for improving UXO discrimination capabilities.

Conducted development and field demonstrations and evaluations of fully polarimetric ground-penetrating radar.

Supported UXO detection and discrimination field efforts at Ft. Ord, California, Kaho'olawe, Hawaii, Badlands Bombing Range, South Dakota, and for the 8th Army in Korea.

Executed the Science and Technology Enhancement program for Jefferson Proving Ground UXO Technology Demonstration Phase IV.

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